



USB Complete: Everything You Need to Develop Custom USB Peripherals

Jan Axelson

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Who should read this book?

This book is for you if you want to know how to design and program a peripheral with a Universal Serial Bus (USB) interface, or if you want to know how to communicate with USB peripherals from the applications you write. These are some of questions the book answers:

What is USB and how do peripherals use it to communicate with PCs? There's a lot to the USB interface, and understanding how USB works is essential in creating hardware and program code that works efficiently and reliably. This book's focus is on the practical knowledge you'll need in selecting components and writing device firmware to communicate over the bus.

How can I decide if my project should use a USB interface? Maybe your design isn't suited for USB. I'll show you how to decide whether it is. If the answer is yes, I'll help you decide which of USB's three speeds and four transfer types to use.

How do I choose a USB controller chip for my peripheral design? Every USB peripheral must contain an intelligent controller. There are dozens of controller chips designed for use in USB peripherals. In this book, I compare popular chip families and offer tips on how to decide, based on both your project's needs and your own background and preferences. As with any embedded-system project, developing a USB device also requires a development system for loading and debugging code, and I cover the options here as well.

How do applications communicate with USB peripherals? To communicate with a USB peripheral, a PC needs two things: a device driver that knows how to communicate with the PC's USB drivers and an application that knows how to talk to the device driver. Some peripherals can use drivers included with Windows. Others may require a custom driver. This book will show you when you can use Windows' built-in drivers and how to communicate with devices from Visual Basic and Visual C++ applications. You'll also find out what's involved in writing a device driver and what tools can help to speed up the process.

How do USB peripherals communicate? USB peripherals typically use a combination of hardware and embedded code to communicate with PCs. In this book, I show how to write the device firmware that enables Windows to identify a device and load the appropriate device driver. I also include example firmware for exchanging data with a PC.

How do I decide whether my peripheral can use bus power, or whether it needs its own supply? A big advantage to USB is that many peripherals can be powered entirely from the bus. Find out whether your device can use this capability and how to manage power use, especially for devices that use battery power.

How can I be sure that my device will operate as smoothly as possible for its end users? On the peripheral side, smooth operation requires understanding the specification's requirements and how the device can meet them. In the PC, proper operation requires a correctly structured information (INF) file that enables Windows to identify the device and software that knows how to communicate with the device as efficiently as possible. This book has information and examples to help with each of these.

What's new in the Second Edition?

In the months after the publication of the first edition of USB Complete, much happened in the world of USB, including the release of version 2.0 of the USB specification. USB 2.0 supports a bus rate of 480 Megabits per second, forty times faster than USB 1.1. This and other developments in hardware and software prompted this second edition of the book.

Rather than just tacking on a chapter about USB 2.0, I've revised the book from start to finish to reflect the changes in 2.0. By popular request, another addition is Visual C++ code to accompany the Visual Basic examples for application communications with USB devices. I've also expanded the material about Windows drivers and applications to include Windows 2000, and have added information on new controller chips and development tools. Other additions and updates are sprinkled throughout, many prompted by reader suggestions.

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From reader reviews:

Bonnie Abramowitz:

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Bessie Kraft:

Reading a book tends to be new life style in this particular era globalization. With reading through you can get a lot of information that can give you benefit in your life. Together with book everyone in this world can share their idea. Guides can also inspire a lot of people. A great deal of author can inspire their very own reader with their story or perhaps their experience. Not only the storyline that share in the ebooks. But also they write about the information about something that you need case in point. How to get the good score toefl, or how to teach your kids, there are many kinds of book which exist now. The authors nowadays always try to improve their skill in writing, they also doing some analysis before they write for their book. One of them is this USB Complete: Everything You Need to Develop Custom USB Peripherals.

Nora Emerson:

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Jodi Dunn:

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